

REMARKS

After the foregoing amendment, claims 1-9 are pending. We have amended claims 1, 3, 7, and 8. Support for these amendments can be found on page 9, line 33 through page 10 line 12.

35 USC §112 Rejection

The Examiner rejected claims 1 and 7 under 35 USC §112, first paragraph, as being a single means claim. We have amended claim 1 to include a laser drive circuit for controlling the power level of the laser beam. We have also amended claim 7 to include a laser drive circuit, which controls the power level of the laser beam, wherein the laser beam is generated at a low power level in accordance with the low level of the synch pattern. We submit that these amendments address the Examiner's §112 rejection. Because independent claims 1 and 7 have not been rejected over prior art, we submit that these claims are in condition for allowance. We further submit that because claim 2 depends from claim 1, claim 2 is allowable for at least the same reason that claim 1 is patentable.

35 USC §102 Rejection

The Examiner has rejected claims 3 and 8 under 35 USC §302(b), as being anticipated by one of JP2000-40302 (the '302 reference), JP10-63433 (the '433 reference), and Bakx (US 5,289,440).

Independent Claim 3

We submit that none of the '032 reference, the '433 reference, and Bakx describe or suggest an interrupt control circuit for interrupting data recording when a predetermined state is detected and the laser beam is generated at a relatively low power level, as recited in amended claim 3.

Although the '302 reference discloses a disk recording apparatus that interrupts data recording, it does not do so when the laser beam is generated at a relatively low power level, as required by claim 3. Instead, the '302 reference discloses a disk recording apparatus that interrupts data recording before the occurrence of a buffer underrun. In particular, the apparatus

restarts the data recording when a buffer underrun determination means 17 determines that a RAM 12 enters a state in which buffer underrun may not occur.

Similar to the '302 reference, the '433 reference describes a disk recording device in which recording is temporarily stopped when the occurrence of underrun is detected. As shown in Figs. 5a and 5b, when the data in a buffer memory 10 is less than a predetermined low level B, the recording device interrupts data recording at the end half point ("B" in Fig. 5b) in a sync frame 42, which is the second frame of the ECC brock 30. The recording device restarts the data recording from the top of the second sync frame 42 when the amount of stored data is excess the low level B or another predetermined level A. However, YPIO-63433 does not disclose a circuit and a step for interrupting data recording when the laser beam is generated at a relatively low power level.

Bakx discloses an optical reading that determines whether the loading of an output buffer memory 19 must be interrupted. With reference to he flowchart shown in Fig. 3, if loading of the memory is interrupted (step S1), a load circuit 18 is rendered inoperative and the optical reading device stores the position in the track where the loading has been interrupted. When the amount of data stored in the memory 19 reaches a low filling level (YES in step S4), the optical reading device searches the interrupted position. The reading apparatus allows the data reading from the interrupted position after checking the position (YES in step S7).

Bakx also discloses a MO recording device in Fig. 10. The recording device also stores the position in the track where the data recoding has been interrupted. However, Bakx does not disclose a circuit or a step of interrupting the recording operation when the laser beam is generated at the low power level.

Independent Claim 8

We submit that none of the '032 reference, the '433 reference, and Bakx describe or suggest a method for interrupting data recording in a data recorder including "continuing recording until an interval between sectors appears when a predetermined state is detected; and interrupting the recording operation when the laser beam is generated at the low power level in accordance with the synch pattern of a sector, as recited in amended claim 8. As discussed above, the '032

reference, the '433 reference, and Bakx provide interruption on the basis of data underrun. We submit that claim 8 is in condition for allowance.

The Double Patent Rejection

Claims 3 and 9 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over U.S. Serial No. 09/717,772, which is a co-pending application of the applicant (Y/R 10449-025001), in view of the Bakx patent.

✓ The co-pending application discloses a control circuit for a data recorder. However, the co-pending application does not disclose a circuit for interrupting of data recording during a laser level is relatively low and a step of interrupting the recording operation as claimed. And, as discussed above, the Bakx patent fails to disclose the features recited in amended claims 3 and 8.


Thus, even if a person of skill in the art would have combined the teachings of the Bakx patent and the co-pending application, that person would not arrive at the inventions recited in claims 3 and 9. We submit, therefore, that the double patent rejection should be withdrawn.

Attached is a marked-up version of the changes being made by the current amendment.

We ask that all claims be allowed. Please apply any other charges, not covered, or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the claims:

Please amend claims 1, 3, 7, and 8 as follows:

1. (Amended) A control circuit for a data recorder, wherein the data recorder records data on a recording data by emitting a laser beam against a recording medium, the control circuit comprising:

a laser drive circuit for controlling the power level of the laser beam; and
an interrupt control circuit connected to the laser drive circuit, for interrupting data recording when a predetermined state is detected, wherein the interruption occurs when the laser beam is generated at a relatively low power level.

3. (Amended) A controller employed in a data recorder to control interruption and restart of recording data, wherein the data recorder records on a recording medium data stored in a buffer memory by emitting a laser beam against the recording medium, the laser beam being generated at a high level and a low level, the controller comprising:

an address memory for storing at least one of an address of the recording medium and an address of the buffer memory when data recording on the recording medium is interrupted, each address indicating a location of data when the recording interruption occurred;

a synchronizing circuit for sequentially reading the data recorded on the recording medium prior to the recording interruption and the data stored in the buffer memory prior to the recording interruption and synchronizing the recorded data and the stored data;
[and]

a restart circuit for restarting data recording on the recording medium based on the address stored in the address memory[, wherein the controller interrupts] and;

an interrupt control circuit for interrupting data recording when a predetermined state is detected and the laser beam is generated at a relatively low power level.

✓ no
objection
for ✓

7. (Amended) A controller for a data recorder, wherein the data recorder records data on a recording medium by emitting a laser beam against the recording medium, wherein the data is formed by a plurality of sectors, each of the sectors including a synch pattern that has a predetermined number of bits representing a low level, [wherein the laser beam is generated at a low power level in accordance with the low level of the synch pattern,] the controller comprising:

a laser drive circuit, which controls the power level of the laser beam, wherein the laser beam is generated at a low power level in accordance with the low level of the synch pattern; and

an interrupt control circuit for continuing recording until an interval between sectors appears when detecting a predetermined state and interrupting the recording operation when the laser beam is generated at the low power level in accordance with the synch pattern of a sector.

8. (Amended) A method for interrupting data recording in a data recorder, wherein the data recorder records data on a recording medium by emitting a laser beam against the recording medium, and the data is formed by a plurality of sectors, each of the sectors including a synch pattern that has a predetermined number of bits representing a low level, wherein the laser beam is generated at a low power level in accordance with the low level of the synch pattern, the method comprising:

continuing recording until an interval between sectors appears when a predetermined state is detected; and interrupting the recording operation when the laser beam is generated at the low power level in accordance with the synch pattern of a sector.